

STA 6329 Matrix Algebra and Statistical Computing

Fall 2013

Meeting Time: T 5-6 (11:45-13:40) and R 6 (12:50-13:40) in FLO 230

Instructor:

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Office: Griffin Floyd 116B

Phone: 352 – 273 – 2972

Course Web Address: <http://www.stat.ufl.edu/~athienit/sta6329.html>

Office Hours: Office Hours subject to change and will be posted on the course website

Teaching Assistant:

TBA

Office: TBA

Office Hours: Office Hours subject to change and will be posted on the course website

Course Description:

The goal of this course is to cover matrix algebra and two of most popular computational languages in statistics. It will serve as a foundation for other statistics classes. The main topics are:

1. Matrix algebra on Tuesday and Thursday 5th period.
2. Computational language SAS/IML, R (S-plus) and computing skills that are most relevant to statistics on Tuesday 6th period.

Prerequisites: MAC3313 (Calculus III, high-dimensional calculus including partial differentiation and multiple integrals)

Course Materials Required:

Matrix Algebra from a Statistician's Perspective by David A. Harville, Springer, 1997

Statistical software:

The class will be using mainly R and a bit of SAS.

Homework:

There will be about 9 homework sets assigned nearly every week (on a Thursday) that will include matrix algebra and programming and are due the following week.

Exams: There will be two (2) exams,. Dates will be decided in class. The UF scheduled final is December 12th 10:00 but an earlier date may be chosen if convenient for the whole class, such as last day of class on December 4th.

If a student is unable to take an exam at the scheduled time, they must notify the instructor as early as possible. If an emergency situation precludes an advance arrangement, you should let the instructor know within 24 hours of the missed exam. Each case will be reviewed individually. You will be required to provide official documentation to be eligible for make-up examination.

Grades:

Each exam is worth 25% (x2) and the homework 50%.

Grading Scale:

The grading scale will be as follows:

A:	92-100%,	A-:	88- <92%,		
B+:	84- <88%,	B:	80- <84%,	B-:	77- <80%,
C+:	74- <77%,	C:	70- <74%,	C-:	67- <70%,
D+:	64- <67%	D:	56- <64%	D-:	50- <56%
E:	<50%				

To see the effect of the + and – grades on your GPA, look at the following link:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>.

Course Policies:

Academic Dishonesty: I adhere to the University of Florida rules and guidelines for handling instances of academic dishonesty. Please refer to the Office of Students Services for detailed information about the current policies.

Instructor's Honor Code: We the members of the University of Florida community pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

Grading: Grades will be changed only when an error has been made by the instructor.

Incomplete: Incompletes are only assigned when extraordinary circumstances, arising after the date for dropping off the course, prevent the student from completing the course requirements. The student must be currently passing the course and discuss the circumstances with the instructor before the final exam takes place. Having a failing grade in the course is not a valid reason for requesting an incomplete.

Getting Help: Students may ask questions during the lectures (preferred) or the office hours. The TAs will answer questions during office hours. A list of private tutors (if needed) may be obtained from the Statistics Department Secretary in Griffin Floyd 103.

Students with disabilities: Students requesting classroom accommodation must first register with the Dean of Students office. The Dean of Students will provide documentation to the students who must then provide this documentation to the Instructor when requesting information.

Privacy Policies: Student records are confidential. Only information designated "UF directory information" may be released without your written consent. UF views each student as the primary contact for all communication. If your parents contact me about your grade, attendance or other information that is not "UF directory information". I will ask them to contact you.

Course Outline:**Matrix Algebra:**

1. Basic operation in matrices (Ch. 1-2)
2. Linear independence and rank (Ch. 3-4)
3. Linear system (Ch. 5-7)
4. Inverse and g-inverse (Ch. 8-9)
5. Idempotent matrix and projections (Ch 10, 12)
6. Determinant (Ch. 13)
7. Quadratic forms (Ch. 14) and eigenvalues and eigenvectors (Ch. 21)
8. Matrix differentiation (Ch. 15)
9. Kronecker products will be covered if time permits (Ch. 16)
10. Multivariate Normal Distribution

R:

1. Basic R: I/O, Array and matrix, conditioning and do loop
2. Writing functions and using R statistical functions
3. R graphics
4. Simulation Using R
5. Basic linear models

SAS:

1. Input Data
2. Special Types of Data and Working with Spreadsheets
3. Nice Programs & Nice Output
4. Modifying Datasets (Part I)
5. Modifying Datasets (Part II)
6. Univariate Statistics
7. Frequency Tables*
8. SAS Macro Language*
9. SAS IML*

* Will probably not get to cover these materials

The instructor reserves the right to update any parts of this syllabus as necessary. Students will be notified of any changes.

There will be no classes on the following days:

September 2nd : Labor Day

November 8th : Homecoming

November 11th : Veteran's Day

November 27th - 29th : Thanksgiving